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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,216	04/10/2006	Hidekazu Nishiuchi	NNA-110-B	6925

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EXAMINER	
BITAR, NANCY	

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
12/10/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/575,216	NISHIUCHI, HIDEKAZU	
	Examiner	Art Unit	
	NANCY BITAR	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/6/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/22/2009 has been entered.

2. Applicant has amended claims 1-19. Claims 1-19 are currently pending.

3. Applicant's arguments, in the amendment filed 10/22/2009, with respect to the rejections of claims 1-19 under 35 U.S.C. 103(a) have been fully considered but are moot in view of the new ground(s) of rejection necessitated by the amendments. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Suzuki et al (US 6,535,114)

Information Disclosure Statement

4. The Information Disclosure statement dated 10/06/2009 has been considered by the Examiner

Examiner Notes

5. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that,

in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Nagaoka et al (JP 2002-005656)) and Suzuki et al (US 6,535,114).

As to claim 1, 7 and 14; Nagaoka teaches detecting the position of an object in one or more images captured by an image pickup device mounted on a vehicle, comprising:

(a) a memory configures to store a plurality of images captured by the image pickup device, including a first image of an object taken at a first time when the vehicle is balanced and a second image of the object captured at a second time (figure 3 is a flow chart which shows the procedure of the position detection process of the subject in the image processing unit 2, and this processing is performed for every predetermined time. The A/D conversion of the output signal of the cameras 1R and 1L is carried out first, and it stores in an image memory (Step S11, S12, S13). The picture stored in an image memory is a gray scale picture included brightness information, paragraph [0016]; note that Thus, the position coordinate (area center of gravity) of each recognized subject is

stored in a memory as time series position data, and is used for next data processing, paragraph [0025]); and (b) a controller operatively coupled to the memory and configures to determine whether a first pitch angle of the vehicle relative to a q-coordinate in a horizontal direction at the first time is zero and whether a second pitch angle of the vehicle relative to the y-coordinate in the horizontal direction at the second time is zero and to determine the position of the object on the second image based on the position of the object in the first image if the first pitch angle is zero and the second pitch angle is not zero (figure 7C and 8 and figure 4 , and in Step S41, while computing the vehicles movement magnitude D by carrying out time quadrature of the vehicle speed VCAR, from carrying out time quadrature of the yaw rate YR, compute yaw angle (swinging angle) theta of the vehicles 10, a stillness subject is made to correspond to position data, and it memorizes. In Step S42, the position data of a camera coordinate system is computed about a stillness subject. A possibility of being detected during vehicle running uses a "stillness subject" as a subject stationary highly and certainly, for example like a signal or a telegraph pole, and it is judged by the existence of the feature of such a subject here. Specifically, what fulfills the following conditions is judged to be a "stillness subject." paragraph [0044]). Note that the image processing unit 2 constitutes a position sensing device from this embodiment, and it more specifically, Step S23 of drawing 3 and Step S42 of drawing 4 are equivalent to the 1st position data calculating means, Step S45 and Step S46 of drawing 4 are equivalent to an approximation-straight-lines calculating means and a pan angle calculating means, respectively, Step S24 of drawing 3 is equivalent to the 2nd position data calculating means, and Step S44 of drawing 4 is equivalent to a turning travel compensation means, paragraph [0055]).While Nagoaka meets a number of the limitations of the claimed invention, as pointed out more fully above, Nagaoka fails to specifically teach the controller operatively coupled

to the memory and that the pitch angles of the vehicle in reference to the y-coordinate in a horizontal direction is being determines .Specifically, Suzuki et al teaches an image sequence (moving image) photographed by the CCD camera 1 during vehicle travel is transmitted to a recognition process unit 5. The recognition process unit 5 is a computer unit for detecting obstacles on the road surface through image processing. The detection result is output via a display 7 and a speaker 8 in the form of, for example, an alarm indicating presence of an obstacle. Information on an obstacle is used to control actuators 9. Actuators 9 may include an engine, brake, transmission, or steering device. Appropriate control may be performed to avoid obstacles (figure 1 and 6). Moreover, Suzuki clearly teaches the gradient information is obtained based on the difference between the estimated pitch angle estimated from the image sequence as the camera motion and the detected pitch angle detected using a sensor wherein the determined gradient can be used for object recognition and vehicle control. (see figures 8A-9B). It would have been obvious to one of ordinary skill in the art to use the controlling of the pitch angle of Suzuki et la in Nagoaka in order to accurately detect variation in the position of the object due to pitching that takes place .Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 2, 8, and 15 Nagaoka teaches the controller is further configured to compute an image acceleration of the second image; and to determine that the second image was captured when the second pitch angle of the vehicle was zero if the image acceleration of the second image is zero (Step S41, while computing the vehicles movement magnitude D by carrying out time quadrature of the vehicle speed VCAR, from carrying out time quadrature of the yaw rate YR,

compute yaw angle (swinging angle) theta r of the vehicles 10, a stillness subject is made to correspond to position data, and it memorizes, figure 4).

As to claim 3,9,16; Nagaoka teaches the controller is further configured to compute the vertical image velocity of the second image, and to determine that the second image was captured when the second pitch angle of the vehicle was zero if the second image has a zero image acceleration and a non-zero vertical image velocity (That is, if it explains taking the case of a case where the vehicles 10 performed a turning travel of point PA to yaw angle theta r, and reach the point PB, in order to remove influence of a turning travel, it is necessary to change coordinates of the stillness subject OBJS actually observed by position PA into coordinates observed with position PC. Position PC is an intersection with straight-line LH vertical to the straight line LPD through the straight line LPD which shows the present vehicle traveling direction, and position PA. The figure (b) shows a stillness object image on a picture acquired with the camera 1R, and shows a position of an object image when OBJSA, OBJSB, and OBJSC observe in the positions PA, PB, and PC, respectively. The coordinates QOBJA in a camera coordinate system when the stillness subject OBJS is observed in position PA are set to (X1c, Y1c, Z1c) here, If the coordinates QOBJC which can set a camera coordinate system when the stillness subject OBJS is observed in position PC are set to (X1Rc, Y1Rc, Z1Rc), a relation with the coordinates QOBJA and QOBJC, paragraph [0041-0048]; see also equation 7).

As to claim 4, 10, and 17; Nagaoka teaches the memory includes a third image of the object captured at a third time when a third pitch angle the vehicle is zero, and wherein the controller is further configured to determine the position of the object in the second image based on the position

of the object in the first image and the position in the third image (paragraph [0047-0048; figures 15-16).

As to claim 5, 11, and 18, Nagaoka teaches the controller is further configured to compute a size of the object in the second image based on a size of the object in the first image if the second image was captured when second pitch angle of the vehicle was not zero, and to compute a distance between the image pickup device and the object in the second image based on the computed sizes of the objects the first and second images (size of the object , paragraph [0024] and [0045-0046]; figure 15-16).

As to claim 6, 12, and 19, Nagaoka teaches the controller is further configured to compute the vision axis of the image pickup device based on the computed distance if the second image was captured when the second pitch angle of the vehicle was not zero, and to compute the position of the object in the second image based on the computed vision axis (The approximation straight lines which the position data of the time series of a stillness subject is computed, and approximate the relative-displacement locus of a stillness subject based on the position data of the this computed time series are computed, and the pan angle of the optic axis of an imaging means is computed based on the approximation straight lines. And the position data of the subject in a real space coordinate system is computed by amending the position data of the subject in an imaging means coordinate system according to a pan angle. Therefore, the pan angle which shows a gap of the transverse direction of the optic axis of an imaging means can be computed simply and correctly based on the picture acquired by an imaging means, and an exact detecting position can be performed and the position data computed by the 1st position data calculating means is amended using the parameter about the turning travel of vehicles and approximation straight lines are

computed based on the position data after this amendment, Even when vehicles circle during pan angle calculation processing, an exact pan angle can be computed, paragraph [0055-0056])

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nancy Bitar/
Examiner, Art Unit 2624

/Wes Tucker/
Primary Examiner, Art Unit 2624